



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
Group Art Unit 2834

In re

Patent Application of

John Feldner, et. al.

Application No. 10/017,011

Confirmation No. 7797

Filed: December 14, 2001

Examiner: Le, Dang D.

“VEHICLE INCLUDING A THREE-PHASE
GENERATOR”

I, Kerry Dake, hereby certify that this correspondence is being deposited with the US Postal Service as first class mail in an envelope addressed to Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on the date of my signature.

Signature

9/12/03

Date of Signature

DECLARATION OF ROBERT E. ROSE SR. UNDER 37 C.F.R. § 1.132

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

I, Robert E. Rose, Sr., do declare and state the following:

1. I am a citizen of the United States, residing at 420 Armenia Street, Fort Atkinson, Wisconsin 53538 USA.
2. I am a joint inventor on pending U.S. Patent Application No. 10/017,011, filed December 14, 2001, entitled “VEHICLE INCLUDING A THREE-PHASE GENERATOR.”
3. I have a great deal of education and experience which qualifies me to be a person of skill in the field of generator technology and, specifically, generator technology used with a vehicle. I graduated from Purdue University Calumet in Hammond, Indiana in 1969 with a Bachelor of Science degree in physics. From 1969 until today, I have worked at two different

companies. From 1969 to 1977, I worked at Fairbanks-Morris of Beloit, Wisconsin as an engineer. While at Fairbanks-Morris, I worked-on and developed ignition systems for internal-combustion engines. From 1977 to the present, I have been employed at Briggs and Stratton Corporation of Wauwatosa, Wisconsin as an engineer. While at Briggs, I worked-on and developed:

- electrical/electronic circuits used in or with internal-combustion engines, especially engines for vehicles, lawnmowers, outboard engines, and similar apparatus;
- electromechanical devices and accessories used on or combined with internal combustion engines;
- ignition systems of internal-combustion engines;
- motors and generators;
- electrical/electronic circuits used in generators; and
- electrical/electronic circuits of systems having a generator.

Currently, I am employed as a principal engineer.

4. During my employment history, I have been involved in many aspects of the internal-combustion engine industry, including researching and developing vehicles having a generator. I have been an inventor of at least four U.S. patents:

6,603,227	Small engine vehicle including a generator
6,472,790	Stator for an electric motor/generator with a half-integer winding
6,456,515	Three-phase H-bridge assembly and method of assembling the same
6,242,828	Flywheel-rotor apparatus

5. As shown above, I believe my education and experience qualifies me to be a person of skill in the field of generator technology used in or with a vehicle.

6. I have reviewed the U.S. Patent Office action dated June 13, 2003, and I have studied the patents cited by the Examiner in rejecting the patent application claims, particularly U.S. Patent No. 4,853,553 to Hosie, U.S. Patent No. 4,418,677 to Hofmann, U.S. Patent No.

4,973,896 to Shiga et al., U.S. Patent No. 5,698,905 to Ruthlein et al., U.S. Patent No. 5,072,714 to Bengtsson et al., and U.S. Patent No. 5,929,611 to Scott. As one skilled in the art, it is my opinion that the subject matter of the claims is not obvious in view of the references cited in the Office action.

7. The Hosie reference discloses a diesel-electric propulsion operating system for a trolley and diesel bus dual mode vehicle. As suggested by the title, the vehicle operates in one of two modes. Of particular importance to the Office action is the diesel-electric propulsion mode. During this mode, the engine (34) powers the alternator (38), and the alternator (38) produces large amounts of electric power. The power generated by the alternator (38) is rectified, filtered, and controlled by the rectifier/filter (40) and main drive inverter (42). The controlled power of the main driver inverter (42) is provided to the one or more traction motors (20, 44). There is no delivery of usable power to the outside world of the dual mode vehicle.

Figures 1 through 4 illustrate a bus (10) with front and back sections (12, 14). The amount of power required to drive the traction motors (20, 44) is very large (i.e., enough to move a two-section bus carrying passengers). Consequently, the amount of electric power produced by the engine/alternator (34, 38) combination is also very large, i.e., 10-15 kilowatts or greater. As will be discussed in more detail below, because the amount of power produced by the engine/alternator (34, 38) combination is so large, a flywheel-rotor apparatus, such as the one described in the Hofmann reference, is not practical.

8. The Hofmann reference describes an alternator driven by an engine crankshaft (11). A stator is mounted on the engine (10) and includes power coils (19) radially inward of the power magnets (2) mounted on the engine flywheel (12). The power coils (19) are connected in two groups of five coils. Each group of power coils is connected to a bridge circuit (29) made up of four diodes to provide full wave rectification. A switch (30) provided between the groups of coils allows the coils to be connected to the electrical load, represented by the battery (31) in figure 2, in either series or parallel relationship. A pair of shunt type voltage regulators (36) are connected across the bridge rectifier circuits (29) to provide regulated power to charge the battery (31). The battery (31) can then be used to power auxiliary electric equipment such as lights, starters, etc.

The Hofmann reference discloses using the engine to power devices such as outboard motors, snowmobiles, lawn tractors, and similar devices. Also, the Hofmann reference describes utilizing the alternator to charge a battery and then powering auxiliary electrical equipment with a DC voltage from the battery. The auxiliary electric equipment disclosed in the Hofmann reference uses low amounts of power as compared to the traction motors disclosed in the Hosie reference. It is also noted the Hofmann reference does not provide any suggestion that its system can be used to provide commercial line power (for example, 120 VAC power).

9. The Shiga reference discloses an automobile generator apparatus that, among other things, produces commercial line power. The Shiga reference discloses at least eleven problems requiring attention (see col. 1, line 36 to col. 3 line 59) and describes an apparatus that solves each problem (see, for example, col. 3, line 62 to col. 8, line 52). As a result, the Shiga reference discloses a very complex automobile-generator apparatus. It is also noted that the Shiga reference does not provide any suggestion that the engine/alternator (34, 38) includes a flywheel-rotor apparatus. Rather, the Shiga reference teaches away from a flywheel-rotor apparatus. As shown in figures 1-3 and 55-57, the Shiga generator couples to the engine via a pulley.

10. Claim 1 of the application is repeated below.

A vehicle comprising:
a plurality of wheels;
an internal combustion engine having a drive shaft interconnected to drive at least one of the wheels;
a stator having a core and a plurality of conductors disposed on the core in a three-phase arrangement;
a flywheel-rotor apparatus adjacent to the stator and interconnected with the drive shaft, the flywheel-rotor apparatus being operable to magnetically interact with the stator to produce a three-phase alternating current in the conductors, and to provide an inertia to the internal combustion engine;
power circuitry electrically connected to the plurality of conductors, the power circuitry being operable to receive the three-phase alternating current and to controllably generate a single-phase alternating current; and
an electrical outlet electrically connected to the power circuitry, the electrical outlet being configured to receive the single-phase alternating current and make the single-phase alternating current available for use by an operator.

11. With reference to the pending Office action, the Examiner begins his rejection of claim 1 by arguing that the Hosie reference shows a number of the features of the claimed invention. The Examiner acknowledges that Hosie does not show the rotor of the alternator (38) being a flywheel, does not show an electrical outlet electrically connected to the power circuitry, and does not show the electrical outlet being configured to receive the single-phase alternating current and make the single-phase alternating current available for use by an operator. Rather, the Examiner argues it would be obvious to combine aspects of the Hofmann alternator and aspects of the Shiga automobile generator apparatus with the Hosie dual mode diesel electric power system. I disagree.

12. First, I can find no suggestion in the Hosie reference to modify its system to include a flywheel-rotor adjacent to the stator and interconnected with the drive shaft, the flywheel-rotor apparatus being operable to magnetically interact with the stator to produce a three-phase alternating current in the conductors, and to provide an inertia to the internal combustion engine. Moreover, the Examiner does not appear to make any arguments that Hosie provides any such suggestion.

13. Instead, the examiner argues, "Hofmann shows the rotor of the alternator being a flywheel (Figures 1 and 2) for the purpose of reducing size." While the Hofmann reference does state "the alternator may be frequently incorporated into the flywheel structure of the engine to generate electrical power" (col. 1, lines 22-24), the Hosie reference shows and describes a dual mode diesel electric power system for a bus, which does not have the same space limitations as the outboard motors, snowmobiles, lawn tractors, and similar devices disclosed by Hofmann. It should also be noted that the Hofmann reference states the alternator can be frequently incorporated in the flywheel structure of the engine. The alternator described in the Hofmann reference powers a battery (31) and the battery powers DC auxiliary electrical equipment. The Hofmann reference does not generate significant amounts of power as compared to the power requirements for the Hosie vehicle. Therefore, the Hofmann reference does not suggest combining its alternator with a dual mode diesel electric power system as described in the Hosie reference.

14. Accordingly, I believe neither the Hofmann nor Hosie references suggest or provide motivation to combine with the other reference.

15. Even assuming the references suggest the combination as the Examiner argues, I believe it is not reasonable to expect success when combining the flywheel assembly described in the Hofmann reference with the diesel-electric propulsion and operating system described in the Hosie reference. The Hosie system requires at least 10-15 kilowatts to power the traction motors and other systems described in the Hosie reference. The Hofmann reference clearly did not contemplate using the flywheel assembly in such a system. More importantly, I believe it is not possible to generate that much power using the flywheel assembly of Hofmann and also be able to properly cool the alternator.

Specifically and as shown by the Hofmann reference, the flywheel apparatus substantially encloses the stator windings. The large amounts of power required by Hosie results in large amounts of heat in the alternator that needs to be dissipated. In order to dissipate the heat, one would need to move air across the magnets and windings of the alternator. However, because the flywheel apparatus of Hofmann is substantially enclosed, not enough air can move through the alternator. To keep the flywheel assembly and the stator windings cool would be nearly impossible for a 10-15 kilowatt system. Therefore, it would not be reasonable to expect success when combining the flywheel assembly described in the Hofmann reference with the diesel-electric propulsion and operating system described in the Hosie reference.

16. Accordingly, I believe it is not obvious to combine Hofmann with Hosie as argued by the Examiner.

17. Additionally, I believe the Shiga reference teaches away from a flywheel-rotor apparatus by having the generator being coupled to the engine via a pulley.

18. I hereby declare that all statements herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States

Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Robert E. Rose Sr
Robert E. Rose Sr.

Sept. 10, 2003
Date